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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/537,334	03/29/2000	Alexander C. Loui	79676DMW	6591

1333 7590 08/27/2003

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EXAMINER	
LAROSE, COLIN M	

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 08/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/537,334	LOUI ET AL.	
	Examiner	Art Unit	
	Colin M. LaRose	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 June2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *8-17* is/are allowed.

6)☒ Claim(s) *1-7 and 18-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 June 2000* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Arguments and Amendments

1. Applicants' arguments and/or amendments filed 30 June 2003, have been entered and made of record. Applicant has added new claims 25-30.

Response to Amendments and Arguments

2. Applicant's arguments with respect to claims 1 and 18 have been fully considered but they are not persuasive for at least the following reasons.

Applicant argues that claims 1 and 18 are patentable at least because the claimed "time of capture" is not the same as Shimura's "date of registration" (page 3, paragraph 3, paper 7). Applicant points out that the date of registration "clearly refers to the date the image is registered with the disclosed retrieval system shown in figure 1. It has nothing to do with the time of capture."

Examiner respectfully disagrees with the above assertion. "Date" is a unit of time, measured in days. Therefore, the claimed "time" reads on Shimura's "date".

In Shimura's system, when an image is input, or registered, using an input deivce, additional information regarding the image is stored along with it. Included in the additional information is the time, or more specifically, "the date". Column 2, lines 63-67. "The date" and "date of registration" appear to refer to the day the image was captured (registered) by an input device (i.e. a scanner or the like). Inputting the image involves scanning an object or illustration to create (i.e. "capture") the image in electronic form. [As shown in figure 1, the image input unit 11 comprises a scanner for capturing images.] Thus, Shimura's "date" and "date of registration"

refer to the date on which an image is captured for input into the database. And the claimed "time of capture" reads on Shimura's "date of registration".

Furthermore, the claims call for the images to merely be "captured". The claims do not specify how the capturing is performed. Nor do they specify that a camera or other imaging device performs the capturing. Thus, an alternative interpretation is that Shimura's images are "captured" by the database. "Time of capture" could be broadly interpreted as either the time of scanning ("capturing") in an image by an imaging device or inputting ("capturing") an image into the database, both of which are disclosed by Shimura.

Applicant argues that "time of capture" is not inherently interchangeable with "date of registration" (page 4, paragraph 2, paper 7). In the same paragraph, Applicant states that "a *prima facie* case has not been established on any theory of inherency". However, Examiner has not relied on a "theory of inherency" in establishing a *prima facie* case. As explained above, Shimura's "date of registration" essentially denotes the "time of capture" of an image.

Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 2, 18, 19, 25, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,644,765 by Shimura et al. ("Shimura").

Regarding claims 1 and 18, Shimura discloses a method/computer program (figure 4) for detecting duplicate (i.e. substantially similar) images comprising the steps of:

providing at least two images captured at determinable times (figure 2: image 20 and database of images 33 are provided; figure 2, elements 43, 12, and 32 and column 4, lines 1-9: additional information, such as date and time of registration, is associated with each of the images);

computing an indication of image content for each image (figure 4, S17: image features relating to the content of each of the images are computed; e.g. figure 5, S30: feature extracted for image 20 and figure 3, S3: features extracted for database images 33);

determining the time of capture of each of the images (figure 4, S13: additional information (e.g. time of registration) is determined for each image); and

evaluating the indication of image content (figure 4, S18) and the time of capture (figure 4, S16) to determine whether the images are duplicate images (i.e. whether the images are substantially similar with regards to the content of the image blocks and the time of registration).

Regarding claims 2 and 19, Simura discloses computing the image features comprises dividing each image into blocks and computing an indication of image content in each block (e.g. number of black pixels in each block). See column 3, lines 33-37.

Regarding claim 25, Shimura discloses a method (figure 4) for detecting duplicate (i.e. substantially similar) images comprising the steps of:

providing at least two images captured at determinable times from original scenes (figure 2: image 20 and database of images 33 are provided; figure 2, elements 43, 12, and 32 and column 4, lines 1-9: additional information, such as date and time of registration, is associated with each of the images and denote determinable times of capture);

computing an indication of image content for each image by dividing each image into blocks, computing an indication of image content in each block (e.g. number of black pixels in each block; column 3, lines 33-37), and comparing the computed indication of image content in each corresponding block for the two images to generate a similarity metric for each block (32, figure 5 and 52, figure 2: the corresponding blocks (i.e. the computed indications) of the images are compared to generate similarity metric);

determining the time of original capture of each of the images (figure 4, S13: additional information (e.g. time of registration) is determined for each image); and

evaluating the similarity metric for each block and the time of original capture (figure 4, S16 and S18) to determine whether the images are duplicate images (i.e. whether the images are substantially similar with regards to the content of the image blocks and the time of registration).

Regarding claim 30, Shimura discloses and computing an indication of image content by dividing each image into a plurality of blocks and computing an indication of image content in each block (column 3, lines 33-35: the number of black pixels in each block is computed). The images (20 and 33, figure 2) utilized by Shimura are essentially foreground objects. Therefore, Shimura's blocks are assigned to foreground areas.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 3-7 and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimura in view of U.S. Patent 6,445,818 by Kim et al. ("Kim").

Regarding claims 5 and 22, Shimura discloses the image feature comprises the number of black pixels in each block (column 3, lines 33-35). However, Shimura does not expressly disclose computing a histogram for each block.

Kim discloses a system for determining the content of an image so that an accurate search for the image can be performed. Kim teaches that a conventional method of determining an indication of the image content is to computer histograms for each block in an image. Figure 1C shows an image is first divided into blocks. Then, in figure 1D, a histogram is formed for each block, indicating the image content.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Shimura by Kim in order to compute a histogram for each block, since Kim teaches histograms are conventionally used to compute indications of image content in image blocks, and histograms are a means to determine the number of blacks pixels in each block.

Regarding claims 6 and 23, Shimura teaches comparing a block of one image (e.g. image 20), using the extracted feature, to a corresponding block of another image (e.g. an image in database 33) and using the time difference between capture of the two images to determine whether the images are duplicate images. Figure 4, S13: time information of the two images is compared; figure 4, S17: features of the two images are compared. Bother criteria are used to determine the similarity of the images.

With Kim's modification, the histograms of the two images are compared to determine similarity (column 2, lines 17-20). Kim does not expressly disclose the use of a histogram

intersection metric to compare the histograms, however, using an intersection metric to the determine the similarity of two histograms was well-known and obvious to those skilled in the art. Official notice taken.

Regarding claims 7 and 24, Shimura discloses dividing each image into a plurality of blocks and computing an indication of image content in each block (column 3, lines 33-35: the number of black pixels in each block is computed). The images (20 and 33, figure 2) utilized by Shimura are essentially foreground objects. Therefore, Shimura teaches computing said indication for foreground areas.

Regarding claims 3, 4, 20, and 21, Shimura and Kim do not expressly disclose dividing the images into 4x4, 3x3, or fewer blocks. However, at the time the invention was made, dividing an image into a small number of blocks and processing each block was common in the art and would have been an obvious modification to Shimura and Kim. Official notice taken.

7. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimura and U.S. Patent 6,163,622 by Abdel-Mottaleb et al. ("Abdul-Mottaleb").

Regarding claim 28, Shimura discloses evaluating the similarity metric and the time of capture to determine whether the images are duplicates but is silent to the steps of generating an average of the similarity metrics for the blocks and evaluating the average of the similarity metrics as claimed.

Abdel-Mottaleb discloses a system that determines the similarity between images. In a method similar to that of Shimura, Abdel-Mottaleb, divides the images into blocks and computes an indication of image content for each block (figure 3). Then, for the purposes of determining

the similarity between two images, Abdel-Mottaleb discloses generating an average of the similarity metrics for the blocks (equation (8), column 7). The average of the similarity metrics $S^{\wedge}_K$ is then used for evaluating the similarity between the images.

It would have been obvious to one of ordinary skill in the art at the time of the invention to generate and evaluate the average of similarity metrics for the blocks as claimed since Abdel-Mottaleb teaches that using an average (i.e. the median) of block similarities avoids the problem of too much emphasis being placed on any one of the block similarities (column 7, lines 38-50).

Regarding claim 29, Shimura discloses evaluating the similarity metric comprises comparing one or more blocks of one image to corresponding blocks of another image (32, figure 5 and 52, figure 2: the corresponding blocks (i.e. the computed indications) of the images are compared to generate similarity metric, which is evaluated to determine similarity between the images) and using the time difference between capture of the two images (figure 4, S16) to determine whether the images are duplicate images (i.e. whether the images are substantially similar with regards to the content of the image blocks and the time of registration).

Shimura discloses using "the number of black pixels in each of a plurality of blocks" (column 3, lines 33-35) to generate a similarity metric between the blocks but does not specifically disclose using a histogram intersection metric to compare the one or more blocks of the images.

Abdel-Mottaleb discloses a system that determines the similarity between images. In a method similar to that of Shimura, Abdel-Mottaleb divides the images into blocks and computes an indication of image content for each block (figure 3). The indications are histograms (316, 318, 320, and 322), which denote the numbers of like-colored pixels for each block. The

histograms of corresponding blocks are then compared (120, figure 1) using a histogram intersection metric (equation (8), column 7) to determine the similarity (122) between the images.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Shimura by Abdel-Mottaleb to use a histogram similarity metric for comparing the image blocks since Shimura discloses that a count of black pixels for each block (which is essentially a histogram of the black pixels of each block) is used for comparing the blocks, and Abdel-Mottaleb teaches that, for the purposes of determining the similarity between two images, the number of like-colored pixels of corresponding blocks of the images are compared using a histogram intersection metric to achieve superior matching results (column 2, lines 12-30).

8. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimura and U.S. Patent U.S. Patent 4,143,956 by Miyagawa.

Regarding claim 26, Shimura teaches inputting additional information (12 and 43, figure 1) of input images, such as the date of capture, using a keyboard, but is silent to determining the time of capture by extracting encoded time information from a film strip used to capture the images. That is, Shimura does not disclose how the time information is acquired, only that it is input.

Miyagawa discloses storing additional time data onto a film strip used to capture an image (column 1, lines 34-39). The time data indicates the time/date at which the image was captured by the camera.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Shimura by Miyagawa to extract time information from a film strip used to capture an image and input the extracted time information using Shimura's additional-information input units (43 and 12, figure 12) since Miyagawa teaches that information pertaining to the time of capture is stored on the film strip at the time of capture, and said time information is extracted, or otherwise accessed, for determining the time of capture.

9. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimura and U.S. Patent 5,805,215 by Mizoguchi.

Regarding claim 27, Shimura teaches inputting additional information (12 and 43, figure 1) of input images, such as the date of capture, using a keyboard, but is silent to determining the time of capture by extracting encoded time information from images provided by a digital camera. That is, Shimura does not disclose how the time information is acquired, only that it is input.

Mizoguchi discloses storing additional time data with images captured using a digital camera (1, figure 1). The time/date of capture is encoded in memory 51 (figure 10) with each image provided by the camera (column 6, lines 57-65). The date/time information is then used as criteria for retrieving images (column 8, lines 7-28).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Shimura by Mizoguchi to extract time information from images provided by a digital camera and input the extracted time information using Shimura's additional-information input units (43 and 12, figure 12) since Mizoguchi teaches that information pertaining to the time of

capture is stored with the image at the time of capture, and said time information is extracted, or otherwise accessed, for determining the time of capture.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (703) 306-3489. The examiner can normally be reached Monday through Thursday from 8:00 to 5:30. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au, can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2600 Customer Service Office whose telephone number is (703) 306-0377.

CML
Group Art Unit 2623
18 August 2003

AMELIA M. AU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600